



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,552	03/10/2004	Sthanunathan RAMAKRISHNAN	TI-36044	2551
23494 7590 05/21/2007 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EXAMINER HUANG, DAVID S	
			ART UNIT	PAPER NUMBER
			2609	
			NOTIFICATION DATE	DELIVERY MODE
			05/21/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com
uspto@dlemail.itg.ti.com

Office Action Summary

Application No.

10/708,552

Applicant(s)

RAMAKRISHNAN ET AL.

Examiner

David Huang

Art Unit

2609

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-23 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08) /
Paper No(s)/Mail Date 3/29/2004.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The reference listed in the Information Disclosure Statement filed on March 29, 2004 is of poor quality such that parts of the document are not legible (bad original copy). However, the examiner has found an electronic equivalent of the document, made of record, which has been considered by the examiner (see attached PTO-1449 form or PTO/SB/08A and 08B forms and Notice of References Cited form 892).

Specification

2. The disclosure is objected to because of the following informalities: There are several typographical errors present in the specification including symbols that were not were not decoded correctly (font, page 20, [0062]), missing words or numbers (page 13, [0042]), and missing spaces (page 15, [0045]).

Appropriate correction is required.

Claim Objections

3. Claim 14 is objected to because of the following informalities: Typographical errors in the first limitation of the claim make the claim difficult to understand (line 2). There appear to be missing words and spaces regarding the amplifier limitation. For examination on the merits, the limitation will be read as “an amplifier amplifying said signal portion...” Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2609

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-4, 8-9, and 18-20** are rejected under 35 U.S.C. 102(b) as being anticipated by Hoshikuki et al. (US Patent 6,141,392).

Regarding **claims 1, 8 and 18**, Hoshikuki et al. disclose a method and a device implementing the method of receiving a packet containing a plurality of data symbols (column 1, lines 4-7), said method being performed in a receiver (diversity receiver, column 2, lines 39-41) connected to a plurality of antennas containing a first antenna and a second antenna (column 2, lines 41-43; it is inherent that the receiver and connected antennas are a device, 20, Figure 1), said method and receiver (means) comprising:

generating a corresponding plurality of parameters (correlation peaks, column 2, lines 59-61) by examining a respective signal portion received on each of said plurality of antennas, wherein said signal portion corresponds to a non-payload portion of said packet (preamble section, column 2, lines 31-34), said corresponding plurality of parameters comprising a first plurality of parameters and a second plurality of parameters respectively corresponding to said first antenna and said second antenna ((3)correlation signal outputted for antenna #1 and #2, column 4, lines 61-67; see Figure 2);

selecting one of said plurality of antennas based on said corresponding plurality of parameters (column 5, lines 28-38, see Figures 1 and 2); and

receiving a payload portion of said packet on said one of said plurality of antennas (column 5, lines 33-38).

Art Unit: 2609

Regarding **claims 2, 9, and 19**, Hoshikuki et al. disclose everything claimed as applied above (see *claims 1, 8, and 18*), and further disclose wherein said plurality of parameters comprise a correlation value representing the similarity of said signal portion with a corresponding expected signal according to a pre-defined protocol (column 4, lines 38-54).

Regarding **claims 3, 10, and 20**, Hoshikuki et al. disclose everything claimed as applied above (see *claims 2, 9, and 19*), and further disclose wherein said generating (block/means) generates a sequence of digital values corresponding to said signal portion, and wherein said corresponding expected signal is represented by a sequence of expected values according to a spread sequence protocol (spread code generator 26, column 3, lines 45-46; see figure 1(a)).

Regarding **claim 4**, Hoshikuki et al. disclose everything claimed as applied above (see *claim 3*), and further disclose wherein said sequence of expected values comprises a spread spectrum sequence (spread code series column 3, lines 46).

Regarding **claim 22**, Hoshikuki et al. disclose everything claimed as applied above (see *claim 19*), and further disclose wherein said plurality of parameters comprise a strength of said signal portion (correlation peak, column 4, lines 50-52).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2609

7. **Claims 5, 11 and 21** rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshikuki et al. (US Patent 6,141,392) in view of applicants' admitted prior art (detailed description, page 5, [0018]).

Regarding **claims 5, 11, and 21**, Hoshikuki et al. disclose everything claimed as applied above (see *claims 4, 10, and 20*), but fail to expressly disclose wherein said spread spectrum sequence comprises a Barker sequence.

However, applicants' admitted prior art discloses Barker Sequences are well known in the relevant arts (page 5, [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Hoshikuki et al. with a Barker sequence since it is well known in the art and would have been an obvious engineering expedient.

8. **Claims 6, 12-13 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshikuki et al. (US Patent 6,141,392) in view of Caples et al. (US Patent 4,291,410).

Regarding **claim 6, 12, and 23**, Hoshikuki et al. discloses everything claimed as applied above (see *claims 2, 9, and 19*), but fail to explicitly disclose wherein said generating comprises determining a gain factor necessary to amplify said signal portion to a first voltage level, wherein each of said plurality of parameters comprises said gain factor.

Caples et al. disclose an automatic gain control signal generated during the coherent integration process is applied to an input amplifier to ensure that the received signal is maintained at a predetermined level throughout the receiver chain (column 2, lines 35-39, see Figure 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hoshikuki et al. with the automatic gain control signal taught by Caples et al. since it ensures proper reception of data by controlling an amplifier to amplify received signals to a sufficient level for processing (column 3, lines 36-38).

Regarding **claim 13**, Hoshikuki et al. disclose everything claimed as applied above (see *claim 12*), and further disclose a switch coupled to all of said plurality of antennas, said switch connecting said selected one of said plurality of antennas to an end of a path under the control of said selector block (receive antenna change-over circuit 23, column 3, line 40; see Figure 1(a)).

9. **Claims 14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshikuki et al. (US Patent 6,141,392) in view of Caples et al. (US Patent 4,291,410) as applied to claim 13 above, and further in view of Naden et al. (US Patent 5,999,561).

Regarding **claim 14**, Hoshikuki et al. disclose everything claimed as applied above (see *claim 13*), but fail to expressly disclose:

an amplifier said signal portion received by said one of said plurality of antennas to generate an amplified signal;

an analog to digital converter (ADC) sampling said amplified signal to generate a sequence of sampled bits; and

a match filter examining said sequence of sampled bits to generate an encoded bit.

Naden et al. disclose a conventional (well known) direct sequence spread spectrum receiver (column 3, lines 9-16, Figure 1) with RF diversity switch 102 (column 4, lines 16, Figure 1), amplifier 106 (column 4, lines 21-22, Figure 1), a sampling ADC 115 (column 4, lines

Art Unit: 2609

34-36, Figure 1), and digital signal processor (DSP) 116 that despreads the signal into a baseband signal (column 4, lines 39-41, Figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hoshikuki et al. with the receiver taught by Naden et al. since it is well known in the art and is in the same field of endeavor as the claimed invention.

Regarding **claim 16**, in the combination applied to *claim 14*, Hoshikuki et al. further disclose wherein said amplifier, said ADC and said matching filter are connected in another end of said path (switch 102 and Figure 1).

10. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshikuki et al. (US Patent 6,141,392) in view of Caples et al. (US Patent 4,291,410) and Naden et al. (US Patent 5,999,561) as applied to *claim 14* above, and further in view of Butler et al. (US Patent 6,420,934).

Regarding **claim 15**, the combination applied to *claim 14* above fails to expressly disclose wherein said first voltage level is determined by a range of operation of said ADC.

Butler et al. disclose increasing the VGA gains relative to the measured signal with very high, high, low, very low gain jumps so as to bring the AGC output level within the ADC nominal range (sweet spot) within one decision cycle.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination applied to *claim 14* to set the first voltage level based on the range of the ADC as claimed since it ensures the ADC is operating at the voltage level for which it was designed.

Art Unit: 2609

11. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshikuki et al. (US Patent 6,141,392) in view of Caples et al. (US Patent 4,291,410) and Naden et al. (US Patent 5,999,561) as applied to *claim 14* above, and further in view of Poegel et al. (US Patent Application Publication 2003/0169706) and applicants' admitted prior art (detailed description, page 5, [0018]).

Regarding **claim 17**, the combination applied to *claim 14* above fails to expressly disclose wherein said matching filter comprises a Barker match filter.

Poegel et al. disclose a preamble detection circuit comprising a Barker matched filter which receives the signal from an A/D converter (page 4, [0047]).

Hoshikuki et al., Caples et al., Naden et al., and Poegel et al. fail to expressly disclose Barker sequences.

Barker sequences are well known in the relevant arts as is evidenced by applicants' admitted prior art (page 5, [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the combination applied to claim 14 with the preamble detection circuit taught by Poegel et al. since implementing the matched filter with a Barker sequence would have been an obvious engineering expedient. Likewise Poegel et al.'s invention is a switched combining antenna diversity technique which solves the same problem and is in the same field of endeavor as applicants' invention.

Allowable Subject Matter

12. **Claim 7** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Citation of Pertinent Prior Art

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Matsui et al. (US Patent Application Publication 2003/0026366) discloses a diversity receiving device with an antenna switching device, A/D converter and digital matched filter.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Huang whose telephone number is (571) 270-1798. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571) 272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2609

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSH/dsh


5-14-07
LANA LE
PRIMARY EXAMINER